

**REMARKS**

The Office Action mailed December 20, 2002, has been received and reviewed. Claims 1 through 23 are currently pending in the application. Claims 1 through 23 stand rejected. Applicants have amended claims 1, 7, 14 and 21 and respectfully request reconsideration of the application as amended herein.

**Claim Objections**

The claims have been objected to for the reason that “[t]he numbering of claims is not in accordance with 37 CFR 1.126 . . . .” The Examiner also states that “[m]isnumbered Claims 8 and 9 on page 40 have been renumbered 10 and 11.” Applicants regret that Page 39 was duplicated as Page 40 in the patent application as filed. Applicants have deleted Page 40 and renumbered pages 41-45 as pages 40-44. Applicants respectfully traverse this objection, in that the claims in the application as filed were not misnumbered but were numbered consecutively from 1 through 23. Applicants respectfully request that the claim numbering remain as in the as filed application, and that claims 8 and 9 on page 40 not be renumbered as claims 10 and 11. For the purposes of this amendment, Applicants will refer to both claim numbers for clarity.

**35 U.S.C. § 103(a) Obviousness Rejections**

Obviousness Rejection Based on U.S. Patent No. 6,430,547 to Busche et al. in View of U.S. Patent No. 6,236,907 to Hauwiller et al.

Applicants’ claims 1 through 23 (Examiner’s claims 1 through 25) stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Busche et al. (U.S. Patent No. 6,430,547) in view of Hauwiller et al. (U.S. Patent No. 6,236,907). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claim 1-23 are improper because the elements for a prima facie case of obviousness are not met. Specifically, the rejection fails to meet the criterion that the prior art references must teach or suggest all the claim limitations.

Claim 1

Applicants submit that any proposed combination of the Busche reference in view of the Hauwiller reference does not and cannot establish a prima facie case of obviousness under 35 U.S.C. § 103(a) regarding the presently claimed invention of amended independent claim 1 because, at the very least, the cited prior art does not teach or suggest all the claim limitation of the presently claimed invention as set forth hereinabove. Applicants submit that any proposed combination of the Busche reference and the Hauwiller reference does not teach or suggest the claim limitations calling for ***“an act of generating a data set from the spatial data using identified attributes selected by a user, the data set being varyingly complex based upon the identified attributes selected by the user”*** among other things.

The Office Action alleges that:

Busche discloses a system including spatial data for a spatial environment (Fig 4; col 2, lines 19-21). Busche further discloses an act of generating a data set from the spatial data using identified attributes (col 8, lines 20-25); . . .

***Busche does not explicitly disclose[] “user selection of the attributes,*** and act of modeling the preprocessed data set to describe relationships between the attributes and the one or more target values (col 4, lines 36-40); and an act of providing recommendations such that the recipe is optimized (col 4, lines 58-62).”

***Hauwiller discloses using an expert system (data mining system) to generate application maps based on field data*** and the relationship to the desired output (col 4, lines 36-40). The system further generates treatment reports in

addition to the application maps (col 4, lines 48-52). *Hauwiller further states that user instructions are used to determine what information is retrieved when generating the reports and maps (col 4, lines 23-26).* (Office Action pp. 3-4; Emphasis added.)

Applicants respectfully disagree with the Office Actions' characterization of the disclosure of Hauwiller. Specifically, the Office Action identifies the term "user inputted instructions and data" from the Hauwiller reference and draws a conclusion that it discloses Applicants' claimed element of *"an act of generating a data set from the spatial data using identified attributes selected by a user, the data set being varyingly complex based upon the identified attributes selected by the user"*. A precise reading of Hauwiller and its disclosures specific to 'user acts' reveals that the specific user specified acts apparently are limited to (i) "User Input 208" of FIG. 2; (ii) "User Input 1 208a" and "User Input 2 208b", both of FIG. 3; and (iii) "User Equation Modify/Add 208" of FIG. 8.

Hauwiller is consistent with description of user input being limited to (i) specifying the creation of a specific geographical map (col. 4, lines 7-8), (ii) establishing relationships between the segregated attribute data and geographical data (col. 4, lines 44-48) and (iii) recommending equations generating an application map for a particular dispensing material (col. 9, lines 20-24).

Specifically regarding Hauwiller's FIG. 2 disclosure, Hauwiller discloses "a system 200 for creating application maps 106 for controlling agricultural equipment 108. It is preferable that system 200 utilize a combination of attribute data 202 and geographical data 204 in combination with *specific user data 208 (i.e. application rate equations)*. The *user inputs instructions to the system for creating a particular map via user input 208.*" (Col. 4, lines 2-8). "Attribute and geographic data 202 and 204 such as field boundary data 212, future crops 214, and soil sample data 210 may be retrieved as illustrated at 222 for *producing agricultural products and treatment maps and reports (application maps) 106 based upon user inputted instructions and data 208.*" (Col. 4, lines 22-27). "The processor or expert system 216 *creates application maps* illustrated by block 106 of FIG. 2 *based upon one or more relationships* between one or more factors relating to crop production. *These relationships* are preferably mathematical, spatial, and

*may be user defined* and/or other relationships . . . *to establish such relationships* relating to crop production *emanating from attribute data and geographical data.*" (Col. 4, lines 40-48; Emphasis added.)

Specifically regarding Hauwiller's FIG. 3, "Looking again at FIG. 3, various combinations of desired data are retrieved 222 from database 206 based upon user input 208a [e.g., "instructions to the system for creating a particular map" (col. 4, lines 7-8)]. This desired data is then optionally combined with any desired user defined data 208b as well as any desired agricultural products and treatments data 224 for processing by the expert system 216." (Col. 9, lines 8-13).

Specifically regarding Hauwiller's FIG. 8, "FIG. 8 illustrates storage and execution of recommendation equations 226. Recommendation equations 226 are stored in a database 206 and retrieved as illustrated by block 222 for execution. Recommendation equations 226 may be predefined equations or may be user inputted or defined as illustrated by block 208 . . . [e]quations 226 are parsed at the time of creating precision farming application maps" (col. 13, lines 8-16).

Clearly, Hauwiller allows the user to select a map and perhaps matches attribute data with geographical data, but Hauwiller does not disclose Applicants' claimed element of "*an act of generating a data set from the spatial data using identified attributes selected by a user, the data set being varyingly complex based upon the identified attributes selected by the user*".

While Hauwiller is silent on 'attributes selected by a user,' the Busche reference discloses an automated algorithmic selection approach as the only and preferred selection approach. Specifically, any attribute selection disclosure of Busche includes only two approaches, each of which is implemented as an automatic algorithmic approach entirely devoid of user selection as claimed by Applicants. Specifically, Busche discloses that "[t]here are two common techniques for attribute selection. [(i)] The filter approach is fairly simple and independent of the data mining technique being used [wherein] a table is made . . . [(ii)] The second techniques for attribute selection is called a wrapper approach where attribute selection is optimized for a particular data mining algorithm." (Col. 8, lines 32-44).

Applicants submit that neither Busche nor Hauwiller, either individually or in any proper combination teach, suggest or motivate Applicants' claimed element of "generating a data set from the spatial data using identified attributes selected by the user, the data set being varyingly complex based upon the identified attributes selected by the user". Applicants submit that any rejection of the presently claimed invention based upon any combination of the Busche and Hauwiller references under 35 U.S.C. § 103 would be a hindsight reconstruction of the presently claimed invention based solely upon the Applicants' disclosure. Such a rejection is neither within the ambit nor the purview of 35 U.S.C. § 103 and, clearly, improper.

Therefore, presently amended claim 1 is clearly allowable over the cited prior art of the Busche reference in view of the Hauwiller reference under 35 U.S.C. § 103. Applicants submit that claim 1 and claims 2-6 depending therefrom are allowable and respectfully request that the rejections to claims 1-6 be withdrawn.

Claim 7

Applicants submit that any proposed combination of the Busche reference in view of the Hauwiller reference does not and cannot establish a prima facie case of obviousness under 35 U.S.C. § 103(a) regarding the presently claimed invention of amended independent claim 7 because, at the very least, the cited prior art does not teach or suggest all the claim limitation of the presently claimed invention as set forth hereinabove. Applicants submit that any proposed combination of the Busche reference and the Hauwiller reference does not teach or suggest the claim limitations calling for "a data generation and manipulation module for loading the data set from the one or more spatial databases based on designated attributes, wherein *the attributes are selected and supplied to the data generation and manipulation module by a user through the user interface*" among other things.

The Office Action alleges that:

*Busche does not explicitly disclose "a user interface, wherein attributes are supplied to the data generation and manipulation module by a user through the user interface"; and a modeling module for describing relationships between*

the attributes and one or more target values, wherein the relationships are obtained from the partitioned data set.”

**Hauwiller discloses** using an expert system (data mining system) to generate application maps based on field data and the relationship to the desired output (col 4, lines 36-40). The system further generates treatment reports in addition to the applications maps (col 4, lines 48-52). Hauwiller further states that ***user instructions are used to determine what information is retrieved when generating the reports and maps (col 4, lines 23-26) and the instructions are entered using a user interface (col 1, lines 65-67).*** (Office Action pp. 4-5; Emphasis added.)

Applicants respectfully disagree with the Office Actions’ characterization of the disclosure of Hauwiller. Specifically, the Office Action identifies the term “user instructions” from the Hauwiller reference and draws a conclusion that it discloses Applicants’ claimed element of “a data generation and manipulation module for loading the data set from the one or more spatial databases based on designated attributes, wherein ***the attributes are selected and supplied to the data generation and manipulation module by a user through the user interface***”.

Applicants sustain herein their arguments regarding the lack of disclosure in Busche and Hauwiller of “a data generation and manipulation module . . . wherein ***the attributes are selected and supplied to the data generation and manipulation module by a user***” as claimed by Applicants. Again, the “user acts” of Hauwiller are confined to (i) specifying the creation of a specific geographical map (col. 4, lines 7-8), (ii) establishing relationships between the segregated attribute data and geographical data (col. 4, lines 44-48) and (iii) recommending equations generating an application map for a particular dispensing material (col. 9, lines 20-24).

Therefore, since Hauwiller does not disclose attributes selected and supplied in a manner consistent with Applicants, and furthermore, in view of the entire motivation of Busche wholly lacking any “user acts” in selecting attributes (i.e., Busche disclosed only algorithmic approaches, namely (i) a “filter approach” and (ii) a “wrapper approach” for attribute selection (see col. 8, lines 32-44)), there exists no motivation or suggestion for combination. Applicants submit that neither Busche nor Hauwiller, either individually or in any proper combination teach, suggest or

motivate Applicants' claimed elements. Applicants submit that any rejection of the presently claimed invention based upon any combination of the Busche and Hauwiller references under 35 U.S.C. § 103 would be a hindsight reconstruction of the presently claimed invention based solely upon the Applicants' disclosure. Such a rejection is neither within the ambit nor the purview of 35 U.S.C. § 103 and, clearly, improper.

Therefore, presently amended claim 7 is clearly allowable over the cited prior art of the Busche reference in view of the Hauwiller reference under 35 U.S.C. § 103. Applicants submit that claim 7 and claims 8-13 depending therefrom are allowable and respectfully request that the rejections to claims 7-13 be withdrawn.

Claim 14 (Examiner renumbered claim 16)

Applicants submit that any proposed combination of the Busche reference in view of the Hauwiller reference does not and cannot establish a prima facie case of obviousness under 35 U.S.C. § 103(a) regarding the presently claimed invention of amended independent claim 14 because, at the very least, the cited prior art does not teach or suggest all the claim limitation of the presently claimed invention as set forth hereinabove. Applicants submit that any proposed combination of the Busche reference and the Hauwiller reference does not teach or suggest the claim limitations calling for "applying spatial data mining functions to the spatial data sets, the *spatial data sets generated using identified attributes selected by a user*, wherein said spatial data mining functions comprise the steps for *modeling the spatial data sets* to provide estimation of predetermined parameters at predetermined points", among other things.

The Office Action alleges that:

***Busche does not explicitly disclose "applying spatial data mining functions to the spatial data sets, wherein said spatial data mining functions comprise the steps for modeling the spatial data sets to provide estimation of predetermined parameters at predetermined points; and using the estimation of the predetermined parameter to accomplish a predetermined purpose, wherein the predetermined purpose includes at least one of . . ."***

***Hauwiller discloses*** using an expert system (data mining system) to generate application maps based on field data and the relationship to the desired

output (col 4, lines 36-40). The system further generates treatment reports in addition to the applications maps (col 4, lines 48-52). Hauwiller further states that *user instructions are used to determine what information is retrieved when generating the reports and maps (col 4, lines 23-26) and the instructions are entered using a user interface (col 1, lines 65-67; col 4, lines 5-35).* (Office Action pp. 5-6; Emphasis added.)

Applicants herein sustain their above-arguments relating to the lack of disclosure by Busche and Hauwiller with regard to “attributes selected by a user” as claimed by Applicants. Therefore, Applicants submit that neither Busche nor Hauwiller, either individually or in any proper combination teach, suggest or motivate Applicants’ invention as claimed in amended independent claim 14. Applicants respectfully request that rejections to claim 14 and claims 15-20 depending therefrom be withdrawn.

Additionally, the Office Action does not address any disclosure within either Busche or Hauwiller which addresses Applicants’ claim elements of “modeling the spatial data sets to provide estimation of predetermined parameters at predetermined points”, among other things. Specifically, Hauwiller performs “[d]ata mining [which] allows a user to search large databases and to discover hidden patterns in that data (col 4, lines 12-13) and generates application maps.

Therefore, since Hauwiller does not disclose attributes selected and supplied in a manner consistent with Applicants, and furthermore, in view of the lack of disclosure relating to Applicants’ “modeling”, Applicants submit that neither Busche nor Hauwiller, either individually or in any proper combination teach, suggest or motivate each of Applicants’ claimed elements.

Therefore, presently amended claim 14 is clearly allowable over the cited prior art of the Busche reference in view of the Hauwiller reference under 35 U.S.C. § 103. Applicants submit that claim 14 and claims 15-20 depending therefrom are allowable and respectfully request that the rejections to claims 14-20 be withdrawn.

Claim 21 (Examiner renumbered claim 23)

Applicants submit that any proposed combination of the Busche reference in view of the Hauwiller reference does not and cannot establish a prima facie case of obviousness under 35



U.S.C. § 103(a) regarding the presently claimed invention of amended independent claim 21 because, at the very least, the cited prior art does not teach or suggest all the claim limitation of the presently claimed invention as set forth hereinabove. Applicants submit that any proposed combination of the Busche reference and the Hauwiller reference does not teach or suggest the claim limitations calling for “applying spatial data mining functions to the spatial data, the *spatial data generated using identified attributes selected by a user*, wherein said spatial data mining functions comprise the steps for *modeling the spatial data* to provide estimation of predetermined parameters at predetermined points”, among other things.

The Office Action alleges that:

*Busche does not explicitly disclose “applying spatial data mining functions to the spatial data, wherein said spatial data mining functions comprise the steps for modeling the spatial data to provide estimation of predetermined parameters at predetermined points; using the results of the spatial data analysis to optimize the treatment of the agricultural field to produce a predetermined yield.”*

*Hauwiller discloses using an expert system (data mining system) to generate application maps based on field data and the relationship to the desired output (col 4, lines 36-40). The system further generates treatment reports in addition to the applications maps (col 4, lines 48-52). Hauwiller further states that user instructions are used to determine what information is retrieved when generating the reports and maps (col 4, lines 23-26) and the instructions are entered using a user interface (col 1, lines 65-67; col 4, lines 5-35). Optimization of the yield is also performed by Hauwiller’s system (col 1, lines 22-25; 35-38). (Office Action pp. 56-7; Emphasis added.)*

Applicants herein sustain their above-arguments relating to the lack of disclosure by Busche and Hauwiller with regard to “attributes selected by a user” as claimed by Applicants. Therefore, Applicants submit that neither Busche nor Hauwiller, either individually or in any proper combination teach, suggest or motivate Applicants’ invention as claimed in amended independent claim 21. Applicants respectfully request that rejections to claim 21 and claims 22-23 depending therefrom be withdrawn.

Additionally, the Office Action does not address any disclosure within either Busche or Hauwiller which addresses Applicants’ claim elements of “modeling the spatial data to provide

estimation of predetermined parameters at predetermined points", among other things. Therefore, since Hauwiller does not disclose attributes selected and supplied in a manner consistent with Applicants, and furthermore, in view of the lack of disclosure relating to Applicants' "modeling", Applicants submit that neither Busche nor Hauwiller, either individually or in any proper combination teach, suggest or motivate each of Applicants' claimed elements.

Therefore, presently amended claim 21 is clearly allowable over the cited prior art of the Busche reference in view of the Hauwiller reference under 35 U.S.C. § 103. Applicants submit that claim 21 and claims 22-23 depending therefrom are allowable and respectfully request that the rejections to claims 21-23 be withdrawn.

#### **Drawings**

Applicants submit herewith corrected formal drawings, under cover of a separate Transmittal of Corrected Formal Drawings. Applicants respectfully request approval of the corrected formal drawings.

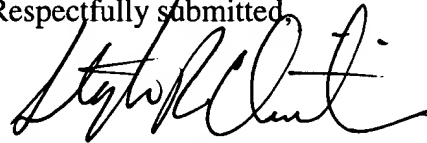
### ENTRY OF AMENDMENTS

The amendments to claims 1, 7, 14 and 21 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search.

### CONCLUSION

Claims 1-23 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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Enclosure: Version With Markings to Show Changes Made

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

1. (Amended) In a system including spatial data for a spatial environment, wherein a recipe is used in the spatial environment, a method for mining the spatial data to optimize the recipe for one or more target values, the method comprising:

an act of generating a data set from the spatial data using identified attributes selected by a user, the data set being varyingly complex based upon the identified attributes selected by the user;

an act of inspecting the generated data set to provide statistical information for the data set;

an act of preprocessing the data set to prepare the data set for modeling;

an act of modeling the preprocessed data set to describe relationships between the attributes and the one or more target values; and

an act of providing recommendations such that the recipe is optimized.

7. (Amended) In a system including one or more spatial databases corresponding to one or more spatial environments, a system for knowledge discovery from the one or more spatial databases, the system comprising:

a user interface; and

a spatial data modeling and analysis module (SDAM module) for extracting knowledge from the one or more spatial databases, the SDAM module comprising:

a data generation and manipulation module for loading the data set from the one or more spatial databases based on designated attributes, wherein the attributes are selected and supplied to the data generation and manipulation module by a user through the user interface;

a data inspection module for providing spatial statistics on the loaded data set;

a data preprocessing module for preparing the data set for modeling, wherein the data preprocessing module removes errors from the data set;

a data partitioning module for dividing the data set into homogenous data

segments which improve data modeling; and  
a modeling module for describing relationships between the attributes and one or more target values, wherein the relationships are obtained from the partitioned data set.

14. (Amended) In a networked computer system that includes a client and a server, wherein the server maintains spatial data sets, a method for analyzing the spatial data sets over the network, the method comprising the steps for:

applying spatial data mining functions to the spatial data sets, the spatial data sets generated using identified attributes selected by a user, wherein said spatial data mining functions comprise the steps for modeling the spatial data sets to provide estimation of predetermined parameters at predetermined points; and classifying the spatial data sets into predetermined classes; and using the estimation of the predetermined parameter to accomplish a predetermined purpose, wherein the predetermined purpose includes at least one of determining how the predicted variable affects a predetermined target variable, providing recommendations as to how to achieve a predetermined target variable, and creating new spatial data mining methods.

21. (Amended) In an environment including spatial data relating to a specific agricultural field, a method for analyzing the spatial data comprising steps for:

applying spatial data mining functions to the spatial data, the spatial data generated using identified attributes selected by a user, wherein said spatial data mining functions comprise the steps for modeling the spatial data to provide estimation of predetermined parameters at predetermined points; and classifying the spatial data into predetermined classes; and

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using the ~~estimation results~~ of the spatial data analysis to optimize the treatment of the agricultural field to produce a predetermined yield.